10/00

OPERATION MANUAL

MANUAL NO. 057-090-00
REV. B

LAB-LINE®
LAB ROTATORS

MODEL NOs: 1304, 1304JPN, 1304-1, 1304-1CE,
1309, 1309JPttN, 1309-1,

1309-1CE,
1314, 1314JPN, 1314-1, 1314-1CE

DESIGNERS AND MANUFACTURERS
A SUBSIDIARY of Barnstead|Thermolyne
1999 North 15th Ave., Melrose Park, IL 60160-1491 USA
PHONE: (319) 556-2241 or (800) 522-5463; FAX: (319) 589-0516

CE

TABLE OF CONTENTS

SECTION	TITLE
1	Introduction
2	Description
3	Specifications
4	Installation
5	Operation
6	Maintenance
7	Replacement Parts
	Warranty

INTRODUCTION

THANK YOU

for selecting Lab-Line Instruments for your equipment needs. For maximum value and ease of start-up,

PLEASE PROCEED AS FOLLOWS:

- Inspect the carton and contents for shipping damage. Notify the carrier immediately if damage is found.
- Use the Accessory Checklist when unpacking to verify that the complete unit has been received. Do not discard packing materials until all is accounted for.
- Read this Operation Manual thoroughly *before* deciding upon an appropriate location for the unit: you will want to consider the availability of power and other unit requirements, as well as user convenience.
- Insist that every operator of this unit becomes familiar with the Operation Section of this manual.
- Be sure to fill out the Warranty Registration Card and mail it in to Lab-Line Instruments within seven (7) days after receiving the unit.

IF

after reading this manual you should have any difficulties with the installation or operation instructions, please call:

Lab-Line Customer Relations Department
(319) 556-2241 or (800) 522-5463

ALL RIGHT RESERVED
The information contained in this manual is the exclusive property of Lab-Line Instruments, Inc., and has been provided solely to enable the users of the equipment described herein to operate and maintain such equipment. Any other use of this information, or the reproduction or transmission of all or any portion of this manual without prior written consent of the manufacturer is expressly prohibited. © 2000, Lab-Line Instruments, Inc.

DESCRIPTION

The Lab-Line Lab Rotators are offered in a range of models designed to meet a variety of laboratory procedures, such as staining and destaining of gels, immunoassays and extractions where disruption to samples needs to be held to a minimum. All models produce a ¾-inch orbit and offer variable-speed versatility from 40 o 220 rpm. 0-60 minute timers are included.

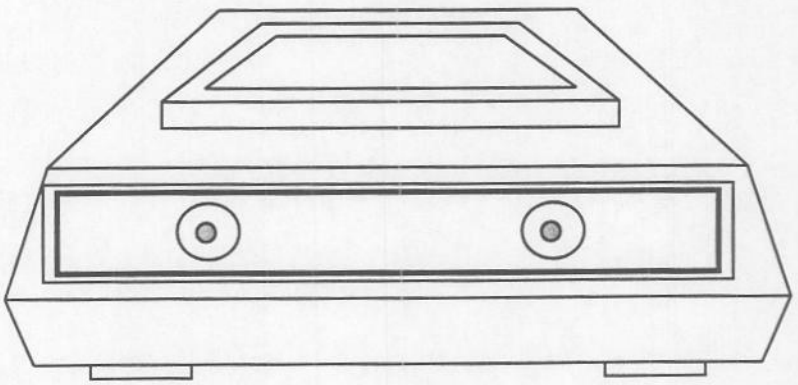
The kinds of vessels/containers that can be accommodated include petri dishes, printed well slides, titer plates, reaction trays, culture plates, flasks and test tube racks.

Models are differentiated by the size of their platforms:

- Model 1304(JPN), 6" X 6"
- Model 1309(JPN), 9" X 9"
- Model 1312(JPN), 12" X 12"

The white silicone rubber surface has the advantage of aiding the viewing of staining and destaining as well as other procedures that may rely on color changes. The slim profile accompanied by a compact width and depth make these units ideal for the limited surface areas throughout a laboratory. Typical Lab-Line construction includes a totally enclosed motor and rugged all-steel body to provide years of virtually maintenance-free performance.

MODEL 1304(JPN):



SPECIFICATIONS

ELECTRICAL CHARACTERISTICS:	Models 1304, 1309, 1314 120 VAC, 50/60 Hz, 0.4 Amps, 50 Watts Models 1304-1(CE), 1309-1(CE), 1314-1(CE) 240 VAC, 50/60 Hz, 0.2 Amps, 50 Watts Models 1304JPN, 1309JPN, 1314JPN 100 VAC, 50/60 Hz, 0.5 Amps, 50 Watts
SPEED OF ROTATION:	40-220 RPM
ROTATING ORBIT:	3/4-inch (2 cm).
MAXIMUM OPERATING LOAD:	Up to 10 lb. (4.5 kg)
TIMING INTERVAL (on variable speed units):	From 1 minute to 60 minutes in 1-minute intervals, or can be set for continuous shaking action.
PLATFORM DIMENSIONS:	Models1304, 1304JPN, 1304-1, 1304-1CE: 6" X 6" (15 cm x 15 cm) Models 1309, 1309JPN, 1309-1, 1309-1CE: 9" X 9" (23 cm x 23 cm) Models 1314, 1314JPN, 1314-1, 1314-1CE: 12" X 12" (31 cm x 31 cm).
MODEL DIMENSIONS (OVERALL):	Models 1304, 1304JPN, 1304-1, 1304-1CE: 8-5/8"W x 10-5/16"D x 4-7/16"H (22 cm x 26 cm x 11 cm) Models 1309, 1309JPN, 1309-1, 1309-1CE: 10-5/8"W x 12-3/8"D x 4-7/16"H (27 cm x 31 cm x 11 cm) Models 1314, 1314JPN, 1314-1, 1314-1CE: 15-5/8W x 12¼"D x 4¼"H (27 cm x 31 cm x 11 cm).
SHIPPING WEIGHT:	Models 1304, 1304JPN, 1304-1, 1304-1CE: 14 lbs. (6 kg) Models 1309, 1309JPN, 1309-1, 1309-1CE: 16 lbs. (7 kg) Models 1314, 1314JPN, 1314-1, 1314-1CE: 17 lbs. (8 kg)

SPECIFICATIONS: (Con't)

UNIT'S ENVIRONMENTAL OPERATING CONDITIONS:

POLLUTION DEGREE:	2
INSTALLATION CATEGORY:	II
ALTITUDE:	2000 Meters MSL (Mean Sea Level)
HUMIDITY:	80% maximum, non-condensing
ELECTRICAL SUPPLY:	120VAC or 240VAC
VOLTAGE TOLERANCE:	±10% of normal rated line
TEMPERATURE:	15ºC to 40ºC
PRODUCT USAGE:	This product is intended for use indoors **only**

SECTION 4

INSTALLATION

√SHIPPING CARTON:

This should be inspected upon delivery. When received, carefully examine for any shipping damage before unpacking. If damage is discovered, the delivering carrier should both specify and sign for the damage on your copy of the delivery receipt.

Open the carton carefully making certain that all parts are accounted for before packaging materials are discarded—after unpacking, if damage is found, promptly report it to the carrier and request a damage inspection promptly.

IMPORTANT: Failure to request an inspection of damage within a few days after receipt of shipment absolves the carrier from any liability for damage: you must call for a damage inspection promptly.

WARNING: DO NOT LIFT OR CARRY ROTATOR BY ITS PLATFORM—DAMAGE TO THE PLATFORM BEARING MAY RESULT.

LOCATION:

Place the unit on a level surface in a convenient location and near a grounded electrical outlet that matches the requirements listed on the nameplate.

NOTE: POSITION ROTATOR SO THAT IN CASE OF EMERGENCY THE PLUG IS WITHIN EASY TO BE QUICKLY DISCONNECTED FROM THE POWER OUTLET.

ELECTRICAL REQUIREMENTS:

120 VAC models require a 120 VAC, 50/60 Hz power source. They are supplied with a 3-wire line cord. It should be plugged into an outlet designed for 3-prong plugs. If an extension cord is used, it also should be the 3-wire grounded type. For an outlet designed to accept 2-prong plugs (ungrounded), it is required that a qualified electrician replace the outlet with a new grounded type.

240 VAC models require a 240 VAC, 50/60 Hz power source. Because of the variety of plug configurations in use worldwide for 240 VAC power, the unit is furnished with the plug removed. The user must install a plug to conform with local code and configuration requirements.

100 VAC models require a 100 VAC, 50/60 Hz power source. Because of the variety of plug configurations in use worldwide for 100 VAC power, the unit is furnished with the plug removed. The user must install a plug to conform with local code and configuration requirements.

If a plug must be installed, use only the 3-prong grounded type, rated for the unit load requirements and matching the power outlet. Make sure the green ground wire is secured to the plug ground terminal.

NOTE: LEAVE THE ROTATOR DISCONNECTED WHEN NOT IN USE.

SECTION 5

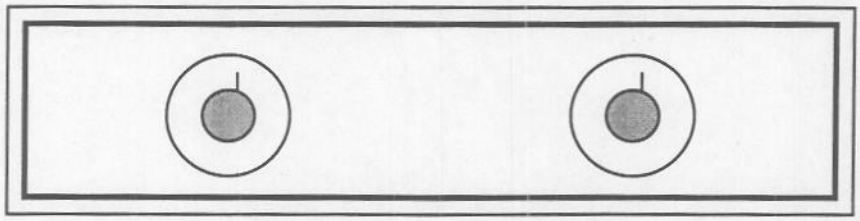
OPERATION

BE ADVISED:

DANGER: DO NOT USE IN THE PRESENCE OF FLAMMABLE OR COMBUSTIBLE MATERIALS OR EXPLOSIVE GASES; DO NOT USE IN THE PRESENCE OF PRESSURIZED OR SEALED CONTAINERS—FIRE OR EXPLOSION MAY RESULT CAUSING DEATH OR SEVERE INJURY.

CAUTION: PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED IF NOT CORRECTLY USED IN THE MANNER SPECIFIED.

CONTROL PANEL:



- Rotate the speed dial to the **0** position.
- Rotate the timer dial to the **0** position. Note that the timer dial functions as the on/off switch. When the timer dial is set at the **0** position, the unit is in an **OFF** condition.
- Connect power cord to electrical outlet per nameplate requirements.
- Load platform with containers or vessels to be rotated.
- Rotate the timer dial either to the **CONTINUOUS** position or a specific timing period. Note that if a timing period of less than 5 minutes is required, first rotate the dial past 10 and then rotate it back to a timing period of an approximated 1, 2, 3 or 4 minutes.
- Rotate speed dial slowly in an increase direction.
- During initial stages of rotation, observe materials on the platform to determine that liquids are not escaping or spilling onto the platform.
- Once materials on the platform are secure, rotate the speed dial to the desired level of rotation.
- If timed operation has been selected, shaking will stop automatically at conclusion of timed period. If **CONTINUOUS** rotation has been selected, rotate both the timer dial and the speed dial to **0**.

OPERATION: (Con't)

- When not in use it is best to leave both the timer dial and the speed dial at **0**—to avoid accidental start-ups and to prevent other accidents.

POWER MAINS PROTECTION:

If a fuse blows, have a qualified person replace it with a properly rated fuse. The internal primary of the transformer fuse is:
5 AMP, Littlefuse® #313.005, 3AG, Slo-Blo Type (Lab-Line Part #330-273-00).

SECTION 6

MAINTENANCE

BE ADVISED:

MAKE NO ATTEMPT TO SERVICE OR REPAIR A LAB-LINE PRODUCT UNDER WARRANTY BEFORE CONSULTING YOUR LAB-LINE DEALER. AFTER THE

WARRANTY PERIOD, SUCH CONSULTATION IS STILL ADVISED, ESPECIALLY WHEN THE REPAIR MAY BE TECHNICALLY SOPHISTICATED OR DIFFICULT.

IF ASSISTANCE IS NEEDED BEYOND WHAT THE DISTRIBUTOR CAN PROVIDE, PLEASE CALL THE LAB-LINE CUSTOMER RELATIONS DEPARTMENT AT (319) 556-2241 OR (800) 522-5463. NO MERCHANDISE, HOWEVER, SHOULD BE RETURNED DIRECTLY TO LAB-LINE WITHOUT PRIOR APPROVAL FROM LAB-LINE.

CAUTION: DISCONNECT PLUG FROM ELECTRICAL OUTLET BEFORE ATTEMPTING ANY MAINTENANCE OR REPAIR OF THIS UNIT.

WARNING: TO AVOID RISK OF ELECTRIC SHOCK, DISCONNECT EQUIPMENT FROM POWER SOURCE BEFORE PERFORMING ANY MAINTENANCE PROCEDURE.

CLEANING SPILLS:

The platform mat is easily removed for cleaning. In the event of any spills on the surfaces of the unit, carry out appropriate neutralization procedures and/or wash off with a cleaning solution made of warm water and a mild detergent. Rinse off with clean water and dry thoroughly. DO NOT use abrasive cleaners on surfaces.

DRIVE MOTOR:

The drive motors are equipped with permanently lubricated bearings and are basically maintenance-free.

REPLACING VARIABLE-SPEED MOTOR BRUSHES:

Remove bottom cover. Remove 2 plastic caps on the rear of the motor. Check brushes for wear. If either brush is worn to ½", replace BOTH brushes.

MAINTENANCE: (Con't)

PARTS REPLACEMENT: (Con't)

TIMER:

- To access the timer, remove the bottom plate. Turn unit over and remove 8, #8 sheet metal screws holding the bottom plate.
- Remove the 2 setscrews from the knob and the retaining nut to separate the timer from the panel. Disconnect the 2 wires from the timer and complete its removal from the unit. Reconnect wires to the new timer and reverse remainder of procedure
- Reverse procedure and reattach the bottom cover.

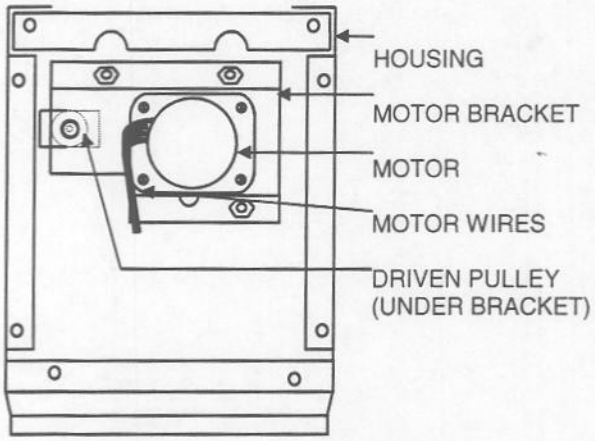
SPEED CONTROL:

- To access the speed control, remove the bottom plate. Turn unit over and remove 8, #8 sheet metal screws holding the bottom plate.
- Remove the 2 setscrews from the knob and the retaining nut to separate the speed control from the panel. Disconnect the 4 wires from the speed control and complete its removal from the unit.
- Reconnect wires to the new speed control and reverse the procedure.

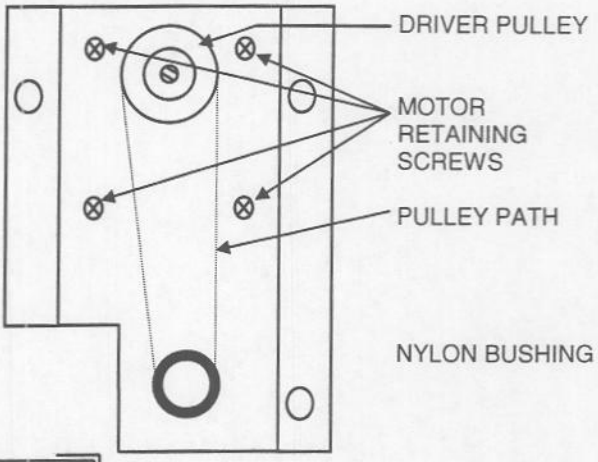
MAINTENANCE: (Con't)

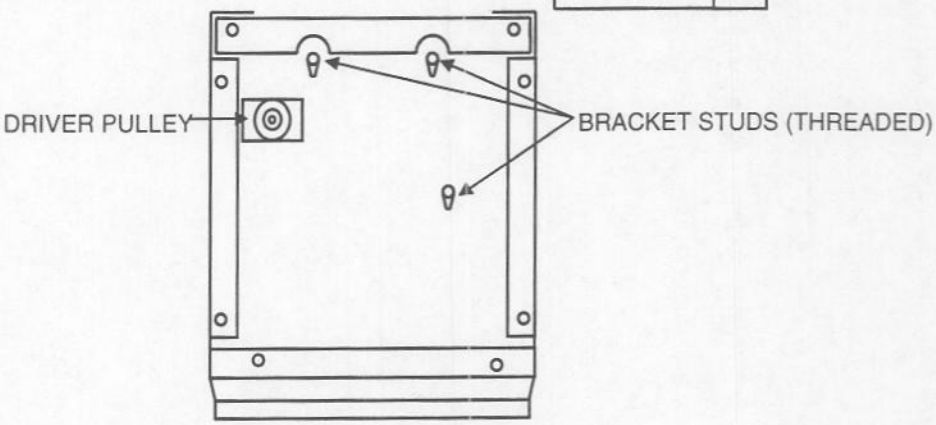
PARTS REPLACEMENT: (Con't)

UNIT, BOTTOM-SIDE-UP: (COVER REMOVED)
MOTOR/PULLEYS NOT YET REMOVED



MOTOR BRACKET, BOTTOM VIEW:

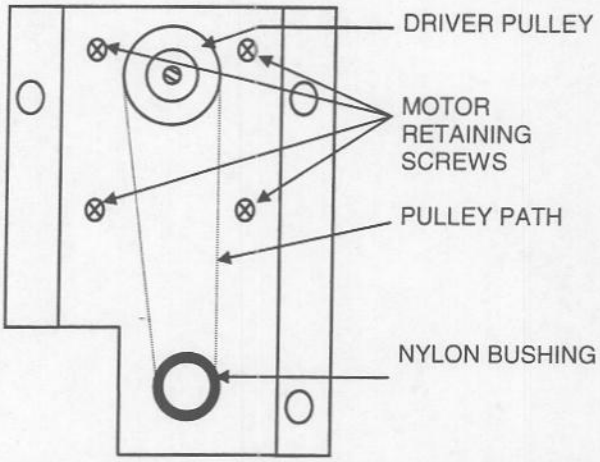




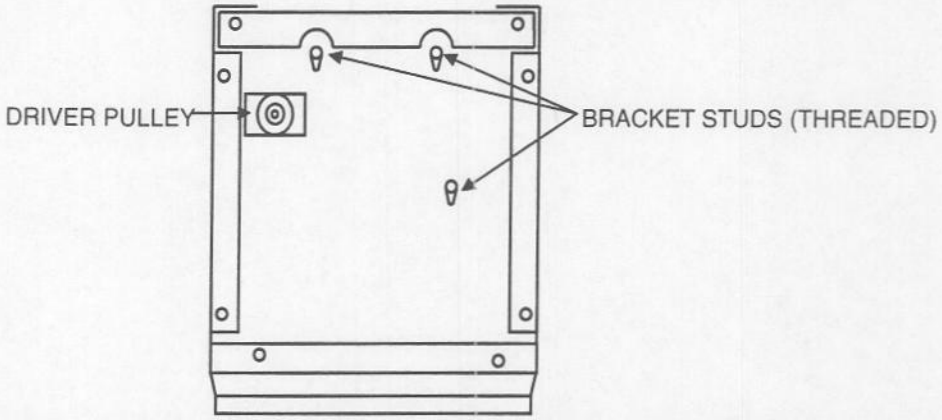
MAINTENANCE: (Con't)

PARTS REPLACEMENT: (Con't)

MOTOR BRACKET, BOTTOM VIEW:



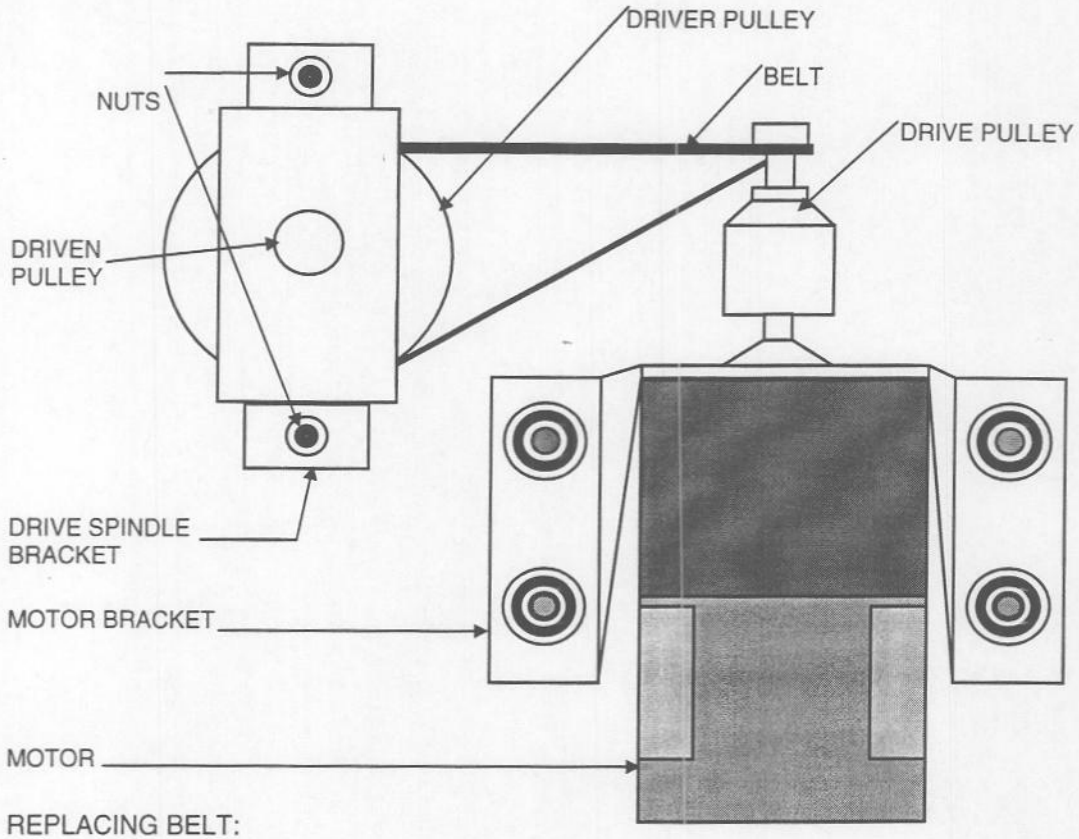
- Remove pulley from the motor shaft loosening the 2 Allen setscrews that hold it to that shaft—take note of its position on the shaft. Separate the motor from the bracket by removing the 4 Phillips screws and lockwashers. Install new motor on the motor bracket and re-install pulley on the motor shaft.



- Clean both pulley grooves and the belt with alcohol and, during installation, be sure not to get any grease on the belt. Install the belt on the motor pulley and hold the belt with some tension on it. As you lower the bracket and motor assembly into the housing, seat the belt in the groove of the other pulley. Move the bracket and motor to the side to engage the bracket studs in the holes, and the upper end of the driven pulley into the nylon bearing of the motor bracket. Press down to seat the bracket. Fastening the washers and nuts to completes the assembly. Reconnect the wires.

MAINTENANCE: (Con't)

REPLACING MOTOR:

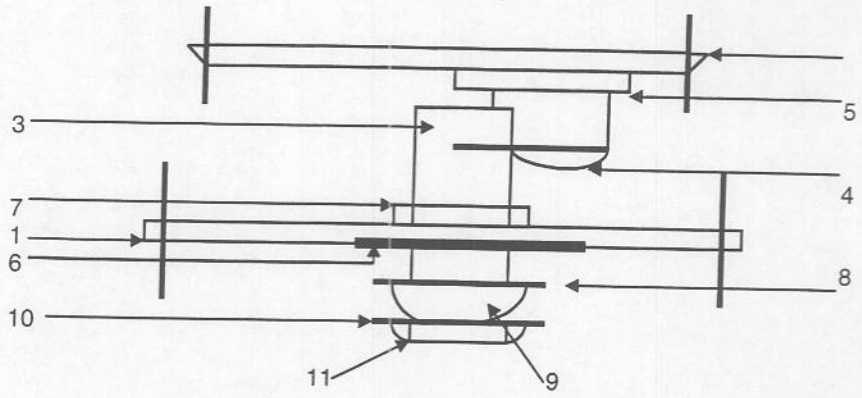


REPLACING BELT:

- Remove bottom cover. Disengage belt from motor pulley. Remove 2 nuts holding the drive-spindle bracket to the body.
- Lift bracket high enough to provide clearance to remove bolt. While bracket is off, check nyliner for wear. Replace if worn or damaged.
- Leave pulley and shaft in place.
- While bracket is raised, drop new belt over shaft and re-install bracket and nuts. Install belt onto large pulley, and then onto small pulley on motor. Plug in and momentarily run the unit. Platform should rotate counterclockwise. If it does not, belt is installed back-ward—reverse belt at drive pulley.
  NOTE: TENSIONING OF BELTS IS NOT NECESSARY.

MAINTENANCE: (Con't)

TYPICAL ECCENTRIC SHAFT CONSTRUCTION:



1. HOUSING
2. PLATFORM ASSEMBLY
3. ECCENTRIC
4. SCREW
5. NYLON WASHER(s)
6. RECTANGLE STUD RETAINER
7. BRONZE BEARING
8. NYLON WASHER
9. CURVED SPRING WASHER
10. CIRCULAR STUD RETAINER
11. GRIP RING

REPLACING BRONZE BEARING:

- Remove bottom cover, as well as motor and belt if so equipped.

  Remove eccentric shaft from body by first removing the grip rings (see above, No. 11) then with needle nose pliers, grip the circular stud retainer (above No. 10) and twist off. Do this to all 3 spindles. Removing the curved spring washer (above No. 9), and the flat nylon washers (above Nos. 5 & 8), will then allow the platform to be removed with the eccentrics attached.

- To remove the bronze bearing, slide a sharp edge screwdriver under the corner and pry up—the retainer will probably be damaged in the process and will have to be replaced.

- Lightly tap the bronze bearing with a soft hammer to remove. Install the new bearing from the top and tap to seat. Install a new retainer and seat firmly against the body.

- Clean and re-grease the eccentrics in the platform and re-install (see above) for correct assembly order). Use a **NEW** circular stud retainer to hold assembly. Reassemble in reverse order.

MAINTENANCE: (Con't)

2

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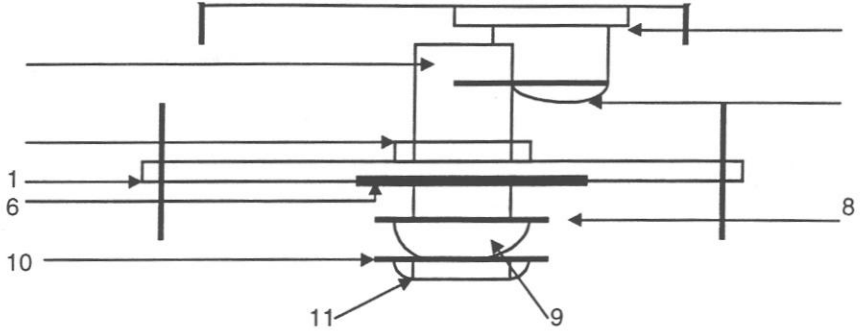

1. HOUSING
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3. ECCENTRIC
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7. BRONZE BEARING
8. NYLON WASHER
9. CURVED SPRING WASHER
10. CIRCULAR STUD RETAINER
11. GRIP RING

REPLACING ECCENTRIC SHAFT:

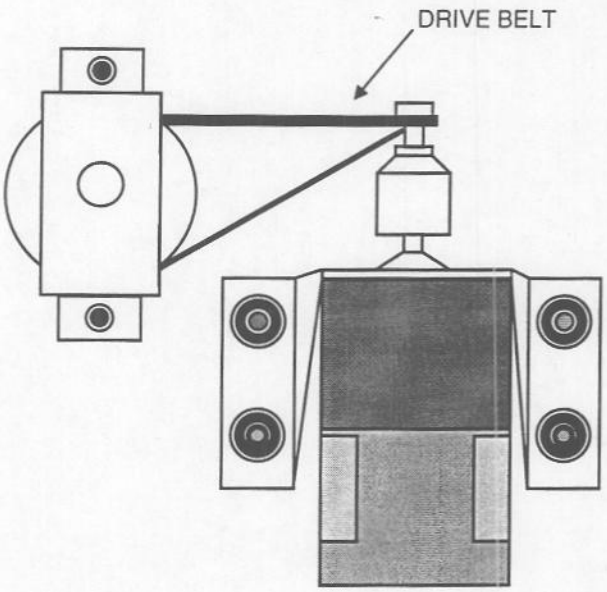
- Remove platform as described on the previous page at "Replacing Bronze Bearing." Remove the screw holding (No. 4 in illustration) the eccentric shaft to the platform. Clean off all old lubricant and reinstall new eccentric shaft using new grease. Reassemble in reverse order.

MAINTENANCE: (Con't)

BRUSH REPLACEMENT:

- Remove bottom cover as previously described. Disengage belt from motor pulley.
- Remove the 2, #10 motor mount nuts and washers and lift the motor out with its bracket.
- Note the slotted brush covers on the opposite sides of the motor.
- Unscrew the brush caps using the largest possible screwdriver tip to avoid marring the slot.

- Inspect the brush. Replace both brushes even if only one is worn to 0.375" (9.5 mm) or less in length.
- Screw the brush caps into place.
- Re-install the motor with the 2 motor mount nuts.
- Re-install the drive belt—see below for correct routing.



SECTION 7

REPLACEMENT PARTS

DESCRIPTION	PART NUMBER
Belt:	150-304-00
Circular Retainer: (must be replaced once removed):	500-594-00
Cordset:	470-132-00
Curved Spring Washer:	564-381-00

Driver Pulley:	150-302-00
Eccentric Shaft (3 required):	720-519-01
Fuse, 5 Amp:	330-273-00
Grip Ring:	500-598-00
Knob, 1304, 1309, 1314:	560-265-00
Motor, 1304, 1309, 1314:	370-350-00
Motor Brush Set (for Motor 370-350-00):	370-350-01
Nyliner Bearing:	140-278-00
Nylon Washer (3/8" ID):	564-382-00
Nylon Washer (¼" ID, x .059 THK):	564-383-00
Nylon Washer (¼" ID, x .010 THK):	564-387-00
Platform Pad:	
Models 1314, 1314JPN, 1314-1, 1314-1CE:	790-371-00
Models 1309, 1309JPN, 1309-1, 1309-1CE:	790-371-01
Models 1304, 1304JPN, 1304-1, 1304-1CE:	790-371-02
Resistor:	411-002-19
Rubber Feet (4 required):	790-214-00
Speed Control:	227-841-00
Strain Relief	380-570-00
Timer (60 Minute):	270-109-00
Driver Pulley:	150-303-00

Wiring Schematics:	
1304, 1304JPN, 1309, 1309JPN, 1314, 1314JPN:	228-501-00
1304-1, 1309-1, 1314-1:	228-542-00
1304-1(CE), 1309-1(CE), 1314-1(CE):	228-792-00

NEED A PART? CALL THE LAB-LINE PARTS HOTLINE.
CALL: (319) 556-2241 or (800) 522-5463; FAX: (319) 589-0516.

LAB-LINE RESERVES THE RIGHT TO MAKE CHANGES TO SPECIFICATIONS WITHOUT PRIOR NOTICE.

WARRANTY

LAB-LINE INSTRUMENTS, INC. ("Lab-Line") warrants that the product manufactured by Lab-Line shall be free of defects in materials and workmanship for a period of time defined on the following page from the first to occur of (i) the date the product is sold by Lab-Line or (ii) the date the product is purchased by the original retail customer (the "Commencement Date"). Except as expressly stated above,

LAB-LINE MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

An authorized representative of Lab-Line must perform all warranty inspections. In the event of a defect covered by Lab-Line's warranty, Lab-Line shall, as its sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product.

In addition, for products sold by Lab-Line within the continental United States or Canada, Lab-Line shall provide free labor to repair the products with the replacement parts, but only for a period of ninety (90) days from the Commencement Date.

Lab-Line's warranty provided hereunder shall be null and void and without further force or effect if there is any (i) repair made to the product by a party other than Lab-Line or its duly authorized service representative, (ii) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, overheating, modification or alteration of the product by any customer or third party or (iii) use of replacement parts that are obtained from a party who is not an authorized dealer of Lab-Line.

IN NO EVENT SHALL LAB-LINE BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR ANY DAMAGES RESULTING FROM LOSS OF USE OR PROFITS, ANTICIPATED OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR PERFORMANCE OF ANY PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), ANY THEORY OF STRICT LIABILITY OR REGULATORY ACTION.

The name of your nearest authorized Lab-Line dealer may be obtained by calling 1-800-522-5463.

DESIGNERS AND MANUFACTURERS
A SUBSIDIARY of BarnsteadIThermolyne
1999 North 15th Ave., Melrose Park, IL 60160-1491 USA
PHONE: (319) 556-2241 or (800) 522-5463; FAX: (319) 589-0516

WARRANTY

12 MONTH PARTS WARRANTY:

- All Environmental Chambers
- Low Temperature B. O. D. Incubators
- Animal Study Chamber
- Controlled Environment Centers
- Biological Work Station
- Refrigerators, Freezers
- Chromatography Refrigerators (5 year parts warranty on compressor only)
- Large Capacity Refrigerators and Freezers (5 year parts warranty on compressor only)

24 MONTH PARTS WARRANTY:

- Frame Clamps, Frame Sets, Lab Jacks

- Saybolt Viscosimeter
- Timers, Samplers, Flasks
- Saf-T-Shield, Safety Tongs
- All Incubators & Ovens
- Dual Action Open Air Shaker
- Reciprocating Shakers (open air and water bath)
- Rockers and Rotators
- Low Cost Shakers
- Environ Blok Shaker
- Titer Plate Shaker
- Multi Wrist Shaker
- Water Baths (excluding Aquabaths), Ultrasonic Cleaners
- Slide Warmers
- Mixers, Stirrers, Hotplates
- Thermal Cyclers
- Blok Heaters
- Aquabaths, lifetime warranty on heaters

LIFETIME PARTS WARRANTY:

- All **ORBITAL** Shakers (not carrying a 24 month parts warranty) offer a lifetime parts warranty on the drive mechanism and a 5 year warranty on all other parts
- Refrigerated Orbital Shakers carry a lifetime warranty on the drive mechanism, 1 year parts warranty on the compressor, and a 5 year warranty on all other parts.

FIRST IN INSTRUMENTS SERVICING SCIENCE, INDUSTRY,
RESEARCH AND EDUCATION
SINCE 1908.

ACCESSORY CHECKLIST

The following loose parts and accessories are packed with this unit. Before discarding any packing materials, please be sure that nothing has been overlooked.

MODEL NO. 1304, 1304JPN, 1304-1, 1304-1CE, 1309, 1309JPN, 1309-1, 1309-1CE, 1314, 1314JPN, 1314-1, 1314-1CE

CHECKED BY: _____

DATE _____

PACKED BY _____

CHECKED	ITEM	PART NUMBER	QUANTITY
_____	Operation Manual	057-090-00	1